



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/732,814	12/11/2003	Nobuaki Tokushige	900-489	5881
23117	7590	03/23/2005	EXAMINER	
NIXON & VANDERHYE, PC 1100 N GLEBE ROAD 8TH FLOOR ARLINGTON, VA 22201-4714			DANG, TRUNG Q	
			ART UNIT	PAPER NUMBER
			2823	

DATE MAILED: 03/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/732,814	TOKUSHIGE, NOBUAKI	
	Examiner	Art Unit	
	Trung Dang	2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>12/11/03, 7/29/04</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Ahn (US. 6,187,677).

With reference to Fig. 7, the reference anticipates the claimed structure in that it discloses a semiconductor device comprising:

a semiconductor substrate 12 providing a semiconductor element 24, 26 formed proximate front and /or back surfaces of the substrate (col. 3, lines 6-9); and

a hard film 28, 30, 32 of SiN or SiO₂ (col. 3, lines 10-36) which covers a part or the entirety of a side of the semiconductor substrate and which has top and bottom surfaces in approximately the same planes as those of the top and bottom surfaces 14, 16 of the semiconductor substrate, wherein the side of the semiconductor substrate covered with the hard film is processed so as to be perpendicular or substantially perpendicular to the surface of the semiconductor substrate.

For claim 2, see Fig. 4 for the through hole 18 and Fig. 7 for the through electrode 40 of aluminum.

For claim 5, the aluminum through electrode 40 is considered as a high melting point metal because the term “high” is a relative term, therefore the melting point of aluminum is high when compared with the melting point of other low melting point material such as wax.

3. Claims 1-3, and 5-7 are rejected under 35 U.S.C. 102(e) as being anticipated by Drewery (US 6,525,407).

With reference to Figs.9-10, 12, 13-17, the prior teaches the claimed invention in that it discloses a manufacturing method for a semiconductor device comprising the steps of:

- (a) forming a recess in a semiconductor substrate 158, the semiconductor substrate having a semiconductor element 192 (col. 7, lines 48-60), the recess being located in a region of the semiconductor substrate where the semiconductor element is not formed (Fig. 14), the recess is being perpendicular to a surface of the semiconductor substrate (Fig. 12);
- (b) filling the recess with a material of a hard film 204;
- (c) adhering a support substrate 182 to the surface of the semiconductor substrate, the surface includes the recess, and making the bottom surface of the semiconductor substrate retrogress until a bottom surface of the hard film is exposed (Fig. 17 and col. 10, lines 39-66); and
- (d) dividing the semiconductor substrate into pieces by cutting the hard film (Fig. 13 and col. 11, lines 13-21).

Note the following interpretations explaining as to how the reference anticipates the claimed limitations:

- a) When the mask layer 200 is considered as a part or a semiconductor

substrate, the trench depicted in Fig. 12 is considered as being perpendicular to a surface of the substrate because the trench includes a vertical portion (vertical edge of the mask 200) that is perpendicular to the surface of the substrate.

b) The insulating layer 204 is considered as a hard film because the term “hard” is a relative term.

For claim 7, see Fig. 10 wherein through holes are filled with a conductive material to form through electrodes.

For the structure claims 1-3 and 5, Fig. 14 depicts every element of the claims, wherein each element is formed by the process as described above in light of the noted interpretations. For claim 5, copper post 210 (Fig. 10) is considered as a high melting point metal for the same reason noted above.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Trung Dang whose telephone number is 571-272-1857. The examiner can normally be reached on Mon-Friday 9:30am-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 571-272-1855. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Trung Dang
Primary Examiner
Art Unit 2823



3/20/05